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**Cellular models and therapies for age-related macular degeneration.**

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**Public Summary:**

Age-related macular degeneration (AMD) is a complex neurodegenerative visual disorder that causes profound physical and psychosocial effects. Visual impairment in AMD is caused by the loss of retinal pigmented epithelium (RPE) cells and the light-sensitive photoreceptor cells that they support. There is currently no effective treatment for the most common form of this disease (dry AMD). A new approach to treating AMD involves the transplantation of RPE cells derived from either human embryonic or induced pluripotent stem cells. Multiple clinical trials are being initiated using a variety of cell therapies. Although many animal models are available for AMD research, most do not recapitulate all aspects of the disease, hampering progress. However, the use of cultured RPE cells in AMD research is well established and, indeed, some of the more recently described RPE-based models show promise for investigating the molecular mechanisms of AMD and for screening drug candidates. Here, we discuss innovative cell-culture models of AMD and emerging stem-cell-based therapies for the treatment of this vision-robbing disease.

**Scientific Abstract:**

Age-related macular degeneration (AMD) is a complex neurodegenerative visual disorder that causes profound physical and psychosocial effects. Visual impairment in AMD is caused by the loss of retinal pigmented epithelium (RPE) cells and the light-sensitive photoreceptor cells that they support. There is currently no effective treatment for the most common form of this disease (dry AMD). A new approach to treating AMD involves the transplantation of RPE cells derived from either human embryonic or induced pluripotent stem cells. Multiple clinical trials are being initiated using a variety of cell therapies. Although many animal models are available for AMD research, most do not recapitulate all aspects of the disease, hampering progress. However, the use of cultured RPE cells in AMD research is well established and, indeed, some of the more recently described RPE-based models show promise for investigating the molecular mechanisms of AMD and for screening drug candidates. Here, we discuss innovative cell-culture models of AMD and emerging stem-cell-based therapies for the treatment of this vision-robbing disease.

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